

Attention deficit hyperactivity disorder (adhd) associated with tics - case report

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Abstract: Attention deficit hyperactivity disorder (ADHD) is the most prevalent neurodevelopmental disorder in children and adolescents, with estimated global prevalence ranging between 5% and 12%. The frequency of ADHD comorbid with tics is significantly higher than expected. Children diagnosed with ADHD are much more likely to have chronic tics compared to those without ADHD. When ADHD occurs alongside tic disorders, treatment can be challenging. Through this case report, we aim to shed light on the unique challenges and potential treatment strategies for this comorbidity. A nine-year-old boy was admitted to the Department of Psychiatry due to hyperactivity, poor concentration, attention, and motor tics such as frequent blinking, grimacing, and head nodding. He was admitted for additional diagnostic procedures and possible initiation of differential psychopharmacotherapy. Psychological testing revealed that his overall intellectual achievement was average, but there was a discrepancy between verbal and manipulative abilities. During hospitalization, observation, comprehensive psychological testing, and the use of tests (SNAP-IV borderline scores) did not directly indicate the presence of hyperkinetic disorder. Therefore, a recommendation was made for a six-month follow-up and continuation of speech therapy and defectology treatment. Meanwhile, he was followed up by a psychiatrist, and based on psychodiagnostic assessments, attention deficit with hyperactivity was diagnosed. After ruling out contraindications, methylphenidate therapy was initiated at a dose of 18mg, titrated to 36mg after two months when a satisfactory therapeutic response was achieved. The introduction of methylphenidate had no significant effect on tics but did not worsen them either. Behavioral disorders and functional impairments associated with ADHD have negative impacts on academic, social, and family aspects. Unlike individuals facing only with Tourette's syndrome (TS), those with both TS and ADHD have more pronounced difficulties in areas such as planning, working memory, inhibitory function, and visual attention. Clinicians treating patients with tics and ADHD may consider using methylphenidate to address ADHD symptoms. However, it is important for clinicians to discuss this issue with caregivers when prescribing the medication and carefully monitor patients due to precautions listed in the drug information.

Keywords: methylphenidate; ADHD; comorbidity; tics; treatment

Introduction

Attention deficit hyperactivity disorder (ADHD) is the most prevalent neurodevelopmental disorder in children and adolescents, with an estimated global prevalence ranging between 5% and 12% [1]. ADHD is a condition with a diverse symptomatology characterized by symptoms of hyperactivity, impulsivity, and disrupted attention.

Tics are characterized by repetitive, structured, and non-rhythmic movements or sounds that are inappropriate in a given context. Tourette's syndrome (TS), a relatively common neurodevelopmental disorder that begins in childhood, is diagnosed when a person exhibits a combination of at least two motor tics and at least one vocal tic for more than a year. It is observed in approximately 1% of school-aged boys [2].

Undoubtedly, ADHD is significantly influenced by heredity through polygenic susceptibility and various environmental risk factors. However, there are inconsistent data regarding the extent to which early upbringing and development influence ADHD, the extent to which gene-environment interactions contribute to inheritance, and how gene-environment correlation explains additional risk factors. Therefore, the actual causes of ADHD remain insufficiently understood [3].

The frequency of ADHD comorbid with tics is significantly higher than expected [4]. Children diagnosed with ADHD are much more likely to have chronic tics (chronic tic disorder, CTD) compared to those without ADHD. In fact, up to 30% of children diagnosed with ADHD simultaneously have chronic tics. These involuntary movements, often in response to an urge, present an additional layer of complexity in the clinical management of ADHD [5], leading to significant increases in additional psychiatric and functional challenges [6].

Possible explanations for the significant overlap between these conditions include a fundamental lack of inhibition associated with dysfunction of frontal-striatal and frontal-parietal networks within cortico-striatal-thalamo-cortical pathways. Visual diagnostic imaging studies show increased activity in the basal ganglia in individuals with tics, leading to increased motor, cognitive, and emotional disinhibition. This is exacerbated by frontal hypoactivity observed in ADHD [7]. The observation that both disorders typically improve over time may be attributed to enhanced myelination of frontal brain regions [8].

When ADHD occurs alongside tic disorders, treatment can be challenging. Medications commonly prescribed to manage ADHD symptoms include stimulants such as methylphenidate and amphetamines, non-stimulants such as atomoxetine, tricyclic antidepressants, and alpha agonists [9]. These alpha agonists are also used as tic medications. Considering the impact of ADHD symptoms on children with tic disorders, ADHD treatment often takes priority over direct medical management of tic symptoms. However, clinicians have historically been hesitant to use stimulants in children with both ADHD and tics due to concerns about potential exacerbation of tic symptoms.

This case report aims to contribute to existing research by presenting a detailed case of ADHD with tics. Through this case report, we hope to illuminate the unique challenges and potential treatment strategies for this comorbidity.

This research was approved by the local Ethics Committee following the Helsinki Declaration.

Presentation of the patient

The nine-year-old boy was admitted to the Psychiatry Clinic due to hyperactivity, poor concentration and attention, as well as motor tics manifested as pronounced blinking, grimacing, and head nodding. He was admitted for additional diagnostic procedures and the possible introduction of alternative psychopharmacotherapy. He was hospitalized for two weeks. The symptoms began with his school attendance, exhibiting immature behavior, refusal to cooperate, poor attention, and concentration, prompting a psychologist to advise a consultation with a psychiatrist who recommended hospitalization.

Psychological testing revealed that his overall intellectual achievement was average, however, there was a discrepancy between his verbal and manipulative abilities. His verbal skills were at the age-appropriate level (IQ=90), while his manipulative abilities were above average (IQ=140). His attention was decreased, as well as his understanding of social situations. He achieved exceptionally high scores in visual and spatial abilities, as well as in distinguishing between relevant and irrelevant information. When faced with problematic situations, he tended to rely on others, showing dependency. Only in prolonged, unstructured testing conditions, was impatience and mild hyperactivity observed. Significant emotional immaturity and introverted characteristics were noted in his personality development. Impulsivity was not observed during the assessment.

An electroencephalogram (EEG) and neurological examination were performed, revealing nonspecific findings indicating mild to moderate cerebral dysfunction, manifested electrocortically, occasionally indicating generalized sharpened high-voltage waves. During the first hospitalization, based on observation, psychological testing, and the use of the Swanson, Nolan and Pelham questionnaire (SNAP-IV borderline values), direct evidence of hyperkinetic disorder could not be established, thus, a six-month follow-up and continuation of logopedic-defectological treatment were recommended. SNAP is a standardized validated questionnaire consisting of nine questions related to symptoms of impulsivity, nine questions related to attention deficit symptoms, and eight questions based on oppositional defiant behavior. At that time, no therapy was initiated. He was discharged with a diagnosis of F95.8 (tic alius, according to the International Classification of Diseases ICD-10), which he had previously, with suspected attention deficit and activity disorder. During this period, the problems with attention and activity continued and intensified.

In the meantime, he was monitored by the responsible psychiatrist, during which based on psychodiagnostic assessments, it was concluded that there was attention deficit with hyperactivity. Additionally, certain stereotypical behaviors were noted, such as twisting of the hands, touching objects,

and rocking, along with persistent pronounced blinking. He exhibited low frustration tolerance, oppositional behavior, and defiance.

High scores were now recorded on the SNAP-IV questionnaire, both by parents and school staff. After excluding contraindications, methylphenidate psychostimulant therapy was introduced at a dose of 18mg. The dose was titrated after two months to 36mg when a satisfactory therapeutic response was achieved. The introduction of methylphenidate resulted in a reduction of symptoms of attention and activity disorders, noticeable improvement in attention, longer periods of remaining calm during school lessons, and reduced movement. Although occasional aggression occurred when faced with frustration, overall behavioral improvement was evident both to parents and school staff.

The introduction of methylphenidate did not have a significant impact on tics, but it also did not worsen this type of problem.

Discussion

This case illustrates the treatment of a child with ADHD and tics, as well as the challenges in diagnosing ADHD. Based on a cross-sectional analysis of children whose parents reported ADHD, it is clear that most of them did not receive medication for ADHD and never received mental health care as outpatient patients. Therefore, there is a need to develop approaches that will improve the recognition of children with ADHD in clinical settings and improve their access to appropriate treatments.

CTD often accompanies ADHD in children. Children who have both ADHD and CTD are more likely to have comorbid anxiety and obsessive-compulsive disorder compared to those with only ADHD. CTD is significantly more common in children with ADHD, four times more common at the age of 7 and almost six times more common at the age of 10, compared to children without ADHD. The presence of concurrent CTD symptoms contributes to increased rates of internal disorders, greater difficulties in peer relationships, and reduced quality of life in children with ADHD.

Behavioral disorders and functional impairments associated with ADHD have negative impacts on academic, social, and family aspects. Unlike individuals facing only Tourette syndrome (TS), those with both TS and ADHD have more pronounced difficulties in areas such as planning, working memory, inhibitory function, and visual attention.

Guidelines for stimulant medications advise against their use in individuals with tics, a concern still shared by many clinicians. However, significant evidence has emerged to challenge the assumption that stimulants are not suitable for children with tics. In a year-long randomized trial in children diagnosed with ADHD, clinically significant tics occurred equally in children receiving methylphenidate or placebo. Interestingly, tics improved during treatment in approximately two-thirds of children with a previous history of tics. A significant randomized controlled trial in children with Tourette syndrome (TS) and ADHD showed moderate but significant improvement in tics with methylphenidate. A meta-analysis concluded that methylphenidate does not worsen tic symptoms.

Although clinicians occasionally notice patients for whom stimulants appear to induce or worsen tics, the above-mentioned year-long study reported that 23.6% of children using the active drug developed moderate to severe tics for the first time, while 22.2% of children on placebo also had such symptoms. Therefore, while there is a possibility that methylphenidate exacerbates tics in some children, on average, it is more likely to improve tics. Any worsening of tics during medication use is likely coincidental. Clinicians treating patients with tics and ADHD may consider using methylphenidate to address ADHD symptoms. However, it is important for clinicians to discuss this issue with caregivers when prescribing the medication and carefully monitor patients for precautions listed in the product information.

CONCLUSION

Methylphenidate can be an important choice when selecting medication for patients with ADHD and tics. Considering that this case report is based on a single case, further research is needed to determine whether methylphenidate can indeed be an effective and safe option for treating ADHD associated with tics in different age groups. Additionally, this case highlights the common practice of individualized treatment rather than standardized approaches, especially in addressing complex neurodevelopmental conditions such as ADHD, often accompanied by additional health issues.

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